PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 1047-014	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/US04/10339	International filing date *(day/month/year)* 02 April 2004 (02.04.2004)	Priority date *(day/month/year)*
International Patent Classification (IPC) or national classification and IPC IPC(7): C08F 216/04, 220/20 and US Cl.: 526/307.7, 318,2, 318.41, 218, 219.6, 227; 523/449; 525/44, 54.1		
Applicant AGROSHIELD, LLC		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *(sent to the applicant and to the International Bureau)* a total of 4 sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) _____ , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:
   - ☒ Box No. I Basis of the report
   - ☐ Box No. II Priority
   - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - ☐ Box No. IV Lack of unity of invention
   - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - ☐ Box No. VI Certain documents cited
   - ☐ Box No. VII Certain defects in the international application
   - ☒ Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
12 October 2005 (12.10.2005)	21 December 2005 (21.12.2005)
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer David Wu Telephone No. (571) 272 1700

Form PCT/IPEA/409 (cover sheet)(April 2005)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US04/10339

Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

☐ the international application in the language in which it was filed.

☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of:

☐ international search (under Rules 12.3 and 23.1(b))

☐ publication of the international application (under Rule 12.4(a))

☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:
pages 1-40 as originally filed/furnished
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☒ the claims:
pages 41-44 as originally filed/furnished
pages* 41-44 as amended (together with any statement) under Article 19
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☐ the drawings:
pages NONE as originally filed/furnished
pages* NONE received by this Authority on _____
pages* NONE received by this Authority on _____

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/figs _____
☐ the sequence listing (*specify*): _____
☐ any table(s) related to the sequence listing (*specify*): _____

** If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US04/10339

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 2, 21	YES
	Claims 1, 3-20, 22-34	NO
Inventive Step (IS)	Claims 2, 21	YES
	Claims 1, 3-20, 22-34	NO
Industrial Applicability (IA)	Claims 1-34	YES
	Claims NONE	NO

2. Citations and Explanations (Rule 70.7)

Claims 1, 3-20, 22-34 lack novelty criteria set out in PCT Article 33(2). The prior art to Davenport et al. disclose an aqueous dispersion comprising polymerized nanoparticles (PNPs) having a mean diameter of 1-50 nm and including as polymerized units, at least one multi-ethylenically unsaturated monomer and at least one ethylenically unsaturated water soluble monomer (abstract). A variety of multi-ethylenically unsaturated monomers, water-soluble ionic monomers and useful ranges of the monomers are disclosed in paragraphs 0010-0014. Initiators useful in the free radical polymerization may be used in amounts ranging from 0.05 to 10% by wt, based on the total weight of the monomers (paragraph 0033). Aqueous PNP composition may be prepared in the presence of surfactants (paragraph 0040). The aqueous compositions may include 1-90% PNP weight fractions (paragraph 0043) and may be used on substrates such as skin, hair, leather etc. (paragraph 0047). The compositions may also include polymer particles with average particle diameters in the range of 50-1000 nm and may be derived from monoethylenically unsaturated acid monomer and multi-ethylenically unsaturated monomers (paragraphs 0050-0052). The Tg of the polymers range from -60 to -150°C and thus include the transition temperature ranges claimed instantly. Thus, the instantly claimed compositions and methods are anticipated by the prior art. It is noted that claims 29-34 do not modify the method recited in claim 23 but merely state various properties that would inherently be present in the compositions.

Claims 1, 3-13, 18-20, 22, 23, 28 lack novelty criteria set out in PCT Article 33(2). The prior art to Fujimoto et al. disclose crosslinked fine particles obtained by polymerizing a compound having one or two radical polymerizable ethylenic groups in a molecule (a1) and a compound having three or more (meth)acryloyl groups in the molecule (a2). Specific examples of (a1) and (a2) are disclosed in paragraphs 0031 and 0035 and the proportion of the two components may range from 55-95% and 5-35%, respectively (paragraph 0037). The polymerizable compositions may include photoinitiators in amounts ranging from 0.01 to 20 parts or thermal initiators in amounts of 0.01 to 5 parts by wt. and may further include conventional additives and emulsifiers (paragraphs 0042, 006-0072). The curable resin compositions may be used in coating materials 9paragarph 0074). Thus, the instantly claimed compositions and methods are anticipated by the prior art.

Claims 2, 21 meet the requirement as set out in PCT Article 33 (2)-33 (3), because the prior art does not teach the claimed limitations.

Claims 1-34 meet the requirement for inventive step set out in PCT Article 33 (4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

Response to Arguments:

It is noted that applicants have amended the claims to recite the heat release temperature range. However, it is the examiner's position that the composition in instant claims is broad and thus, any prior art that satisfies the composition must inherently possess the properties even though the prior art does not explicitly state the same.

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claim 1 as instantly recited is a composition from a plurality of materials comprising a class 1 member, a class 2 member and a class 3 member. This would imply that there are only two monomers and an additive. However, working examples in the disclosure disclose several class 3 members used as monomers to make up the nanoparticulate copolymer. Therefore, the independent claim language should be amended to include at least one class 3 member.

What is claimed is:

1. A composition prepared from a plurality of materials comprising a Class 1 member, a Class 2 member, and a Class 3 member, said Class 1 member contributing approximately 0.1 percent to approximately 10 percent by dry weight of said composition, said Class 2 member contributing approximately 1 percent to approximately 10 percent by dry weight of said composition, and said Class 3 member contributing an amount up to a balance by dry weight of said composition, wherein the composition releases heat when an ambient temperature is about 5°C to about -15°C.

2. The composition of claim 1, wherein the composition is biodegradable.

3. The composition of claim 1, wherein the composition comprises particles.

4. The composition of claim 1, wherein the composition comprises solid particles.

5. The composition of claim 1, wherein the composition comprises nanoparticles.

6. The composition of claim 1, wherein the composition comprises particles having a molecular weight of from about 20,000 to about 50,000,000.

7. The composition of claim 1, wherein the composition comprises particles having an average diameter of from about 2 nanometers to about 1000 nanometers.

8. The composition of claim 1, wherein the composition comprises particles having an average diameter of from about 200 nanometers to about 500 nanometers.

9. The composition of claim 1, wherein the composition comprises particles having an average diameter of from about 100 nanometers to about 200 nanometers.

10. The composition of claim 1, wherein the composition comprises particles having an average diameter of from about 2 nanometers to about 200 nanometers.

11. The composition of claim 1, wherein the composition comprises particles having an average diameter of less than about 1000 nanometers.

12. The composition of claim 1, wherein the composition comprises particles having an average diameter of less than about 500 nanometers.

13. The composition of claim 1, wherein the composition comprises particles having an average diameter of less than about 200 nanometers.

14. The composition of claim 1, wherein the composition releases heat when an ambient temperature is about 3°C to about -14°C.

15. The composition of claim 1, wherein the composition releases heat when an ambient temperature is about 1°C to about -15°C.

16. The composition of claim 1, wherein the composition releases heat when an ambient temperature is less than about -5°C.

17. The composition of claim 1, wherein the composition releases heat when an ambient temperature is less than about -10°C.

18. A mixture comprising a polymer composition prepared from a plurality of materials comprising a Class 1 member, a Class 2 member, and a Class 3 member, said Class 1 member contributing approximately 0.1 percent to approximately 10 percent by dry weight of said polymer composition, said Class 2 member contributing approximately 1 percent to approximately 10 percent by dry weight of said polymer composition, and said Class 3 member contributing up to a balance by dry weight of said polymer composition, wherein the composition releases heat when an ambient temperature is about 5°C to about -15°C.

19. The mixture of claim 18, further comprising water.

20. The mixture of claim 18, further comprising water, said water contributing approximately 90 percent to approximately 99.5 percent of a total weight of said mixture.

21. The mixture of claim 18, further comprising a soybean protein composition.

22. The mixture of claim 18, further comprising one or more components selected from a group comprising micronutrients, macronutrients, pesticides, insecticides, herbicides, rodenticides, fungicides, biocides, plant growth regulators, fertilizers, microbes, soil additives, adhesion promoting-agents, surfactants, and freezing point modifiers.

23. A method comprising a plurality of activities comprising:

providing a mixture comprising water and a composition prepared from a Class 1 member, a Class 2 member, and a Class 3 member, said Class 1 member contributing approximately 0.1 percent to approximately 10 percent by dry weight of said composition, said Class 2 member contributing approximately 1 percent to approximately 10 percent by dry weight of said composition, and said Class 3 member contributing an amount up to a balance by dry weight of said composition, wherein the composition releases heat when an ambient temperature is about 5°C to about -15°C; and

coating at least a portion of a surface of an object with the mixture.

24. The method of claim 23, wherein the object is a plant material.

25. The method of claim 23, wherein the object is a human.

26. The method of claim 23, wherein the surface is human skin.

27. The method of claim 23, wherein the object is an animal.

28. The method of claim 23, further comprising spraying the mixture toward the surface.

29. The method of claim 23, further comprising preventing formation of ice on the surface.

30. The method of claim 23, further comprising preventing dehydration from the object.

31. The method of claim 23, further comprising reducing dehydration from the object.

32. The method of claim 23, further comprising reducing heat transfer via the surface.

33. The method of claim 23, further comprising reducing mass transfer via the surface.

34. The method of claim 23, further comprising reducing kinetic energy transfer to the object.

AMENDED SHEET